REMARKS

I. Prior Rejections In Parent Application

A. Rejections Under §102

CLAIM 1

Current claim 1 corresponds to claim 7 of the parent application for this case. The Examiner rejected former claim 7 as anticipated by Birang (US 5,708,506) under 35 U.S.C. §102(b). Applicant respectfully traverses. Current claim 1 relates to a method for improving step height performance in a CMP process including the steps of:

> mounting a polishing pad onto a semiconductor wafer polisher and moving the polishing surface;
>
> **reducing a roughness of the polishing surface**;
>
> scanning a length of a polishing surface of the polishing pad and obtaining polishing surface scan data;
>
> **determining a polishing surface flatness from the polishing surface scan data**; and
>
> **discontinuing roughness reduction of the polishing surface when the determined polishing surface flatness reaches a desired polishing surface flatness**.

(emphasis added)

Thus, the steps in claim 1 expressly recite the process step of purposely *reducing* the roughness of a polishing pad. The surface flatness is measured and then the *roughness reduction* is discontinued once the desired surface flatness is reached.

Birang discusses a measuring apparatus for detecting surface roughness. The Examiner cited to the background section (Col. 1, line 15 – Col. 2, line 11) and a section of the summary (Col. 2, lines 32-54) in Birang as allegedly teaching the steps claim 1. These sections of Birang discuss how "the pad has to be periodically conditioned to restore its rough surface texture" (Col. 1, lines 57-58) using a pad conditioner "coated with a layer of diamond grit" and "an abrasive slurry to assist in the conditioning process" (Col. 1, lines 65-66;Col. 2, line1). Birang states that it is addressing the problem of deciding when a conditioning process has restored a desired roughness to a polishing pad (Col. 2, lines 12-17) through more accurate surface roughness detection (Col. 2, lines 32-41). The remainder of Birang discusses embodiments of a roughness detector. Birang fails to teach a process of measuring a polishing pad and reducing a roughness of a polishing pad until a desired flatness has been achieved. Birang teaches just the opposite – roughening a pad until a desired roughness has been achieved. Accordingly, Applicant respectfully submits that claim 1 is allowable over the cited art. Claims 2-8 and 11-12 are dependent claims; therefore, their allowability directly follows from the allowability of independent claim 1. Claims 9-10 have been canceled as redundant in view of the claims in the issued parent application.

CLAIM 13

Claim 13 corresponds to former claim 25 of the parent application. Former claim 25 was rejected as allegedly anticipated by Birang. In addition, former claim 25 was rejected as allegedly anticipated by Prabhu (US 6,300,247 B2). Although of different scope than claim 1, claim 13 also distinguishes from Birang and from Pabhu. For example, claim 13 recites:

> **flattening a polishing surface** of the polishing pad with a pre-conditioning member.
> (emphasis added)

As discussed above with respect to claim 1, Birang teaches roughening the surface of a pad using a standard pad conditioner. Claim 13 requires using a pre-conditioning member to accomplish exactly the opposite – *flattening a polishing surface.* Accordingly, for at least this reason, Applicant submits that claim 13 distinguishes over Birang.

Similar to Birang, Prabhu also teaches away from flattening a pad. Prabhu discloses a pad preconditioning process where an impinging stream of particles is directed against the pad. The background of Prabhu carefully notes that types of degradation in pad roughness are not desirable and that standard diamond-coated conditioners can be undesirable because the diamonds may become embedded in the pad and the because the conditioner must be discarded when this happens. The invention disclosed in the Prabhu disclosure relates to applying a stream of particles (including ceramic particles) to remove a small portion of the pad surface, including foreign contaminants, and simultaneously embed some silicon dioxide particles into the pad (Col. 2, lines 58-63; Col. 4, lines 7-23). Unlike Prabhu, which teaches methods for improving the roughness of a pad by embedding abrasive particles from a high velocity particle stream, claim 13 recites *flattening a polishing surface.* Accordingly Applicant submits that claim 13 also distinguishes over Prabhu.

Claims 14-20 are dependent claims, therefore their allowability directly follows from the allowability of independent claim 13.

B. Rejections Under §103

Current claims 4-6, 11, 15 and 17 correspond to claims 10-12, 17, 27 and 30 of the parent case to this application. These claims were formerly rejected as obvious over the combination of Birang and Berman (US 5,990,010). Applicant respectfully disagrees with this rejection. Applicant also notes that claims 4-6 and 11 are dependent on independent claim 1 and claims 15 and 17 are dependent on independent claim 13. Accordingly, Applicant submits that claims 4-6, 11, 15 and 17 are allowable for at least the same reasons as claims 1 and 13, respectively.

II. New Claim 21

New claim 21 recites a method of reducing roughness in a polishing pad free of fixed abrasive particles. Applicant submits that this claim is fully supported by the specification as filed and that no new matter has been added.

III. Conclusion

Consideration of the above amendments and remarks is respectfully solicited. If any questions arise or issues remain, the Examiner is invited to contact the undersigned at the number listed below.

Respectfully submitted,

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